

**Claims**

1. An evaporation system comprising an evaporator (1) heated by process waste steam and a process stage heated by product vapors of the evaporator, in particular at least one further evaporator (3, 5), characterized in that a vapor compression stage (67) is connected to the product vapor exit of the evaporator (1), which compression stage lowers the dew point of the evaporator (1) below the temperature value required for heating the process stage (3, 5) and, by compression of the product vapor, raises it to the temperature value required for heating the process stage (3, 5).
2. The evaporation system as claimed in claim 1, characterized in that the process waste steam is saturated process steam.
3. The evaporation system as claimed in claim 2, characterized in that the saturated process steam is generated without condensation from superheated process waste steam by supplying water or condensate.
4. The evaporation system as claimed in claim 3, characterized in that, for the condensation-free conversion of the superheated process waste steam into saturated and purified process steam, a wet washer (33) which purifies the superheated process waste steam is provided.
5. The evaporation system as claimed in claim 4, characterized in that a delivery pump (5), in particular in the form of a fan, is arranged at a point in the process steam route from the drier, via the wet washer (33), the heating space of the evaporator (1), a waste steam line (55) and a waste steam chimney (57).

6. The evaporation system as claimed in claim 4 or 5, characterized in that condensate from at least one of the evaporators (1, 3, 5) can be fed to the wet washer (33) for the saturation and purification of the superheated process waste steam.

7. The evaporation system as claimed in any of claims 1 to 6, characterized in that the compression stage (67) is in the form of a mechanical vapor compression stage.